

D E F E N S E
A N D A R M S
C O N T R O L
S T U D I E S
P R O G R A M

Annual Report • 1991–1992

MASSACHUSETTS
INSTITUTE
OF TECHNOLOGY



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DEFENSE AND ARMS CONTROL STUDIES PROGRAM

The Defense and Arms Control Studies (DACS) Program is a graduate-level, research and training program based at the MIT Center for International Studies. It traces its origins to two initiatives. One is the teaching on international security topics that Professor William Kaufmann began in the 1960s in the MIT Political Science Department. The other is the MIT-wide seminars on nuclear weapons and arms control policy that Professor Jack Ruina and Professor George Rathjens created in the mid 1970s.

The program's teaching ties are primarily but not exclusively with the Political Science Department at MIT. The DACS faculty, however, includes natural scientists and engineers as well as social scientists. Of particular pride to the program is its ability to integrate technical and political analyses in studies of international security issues.

Several of the DACS faculty members have had extensive government experience. They and the other program faculty advise or comment frequently on current policy problems. But the program's prime task is educating those young men and women who will be the next generation of scholars and practitioners in international security policy making. The program's research and public service activities necessarily complement that effort.

The Center for International Studies is a major unit of the School of Humanities and Social Science at MIT and seeks to encourage the analysis of issues of continuing public concern. Key components of the Center in addition to DACS are Seminar XXI, which offers training in the analysis of international issues for senior military officers, government officials, and industry executives; and the MIT Japan Program, which conducts research and educational activities to further knowledge about Japanese technology, economic activities, and politics.

COVER PHOTO

BUNKER HILL MONUMENT
VIEW FROM MONUMENT AVENUE, CHARLESTOWN, MA
PHOTOGRAPH BY OWEN HARTFORD



REPORT OF THE DIRECTOR

By any standard 1991 was an incredible year, containing as it did the Gulf War, the failed Soviet Coup, and the dissolution of the Soviet Union. Although we have a long term research agenda for our program, we could not ignore the three most significant developments in international security of the last several decades. Each told us something important about security problems of the future and provided directions for research.

The Gulf War was a lesson in the wonders and limits of collective security. Aggression was stopped through the coordinated action of many nations. The operation was, in nearly all aspects, brilliantly conceived and carefully conducted. The United States had the cooperation of all the major powers and several of the lesser ones as it assembled a powerful international force to oust Saddam Hussein from Kuwait. Warnings were issued, sanctions imposed, diplomacy explored, and then in January measured force was applied. With precision unmatched in history, the U.S.-led coalition destroyed the main military assets of Iraq and compelled that country to abandon Kuwait.

But the limits of collective action were also apparent in the crisis. Nothing would have happened to liberate Kuwait without the determined exercise of U.S. military power and logistical capabilities. Every other participant in the coalition, including the British and the French, helped legitimize the action, but offered what in essence were only token military contributions. Two of the world's leading economic powers, Japan and Germany, were constitutionally unable to participate directly, and decided only after much urging to pay others to carry their burdens. And, in the end, the coalition buckled when important decisions had to be made about the political future of Iraq. While the coalition forces watched, the troops of Saddam Hussein were allowed to destroy independence movements of both the Kurds and the Shiites, with great loss of life.

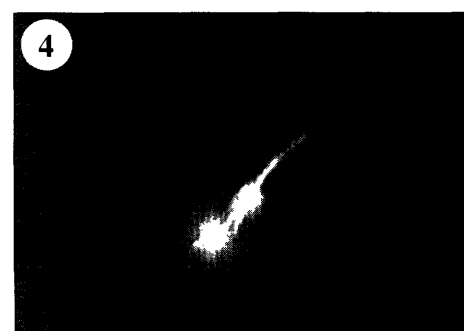
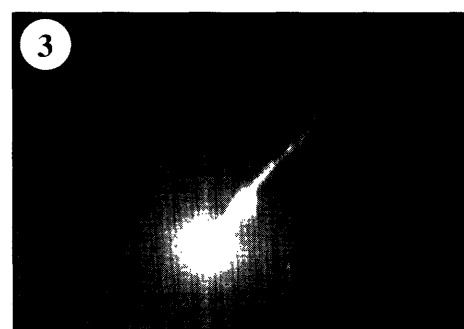
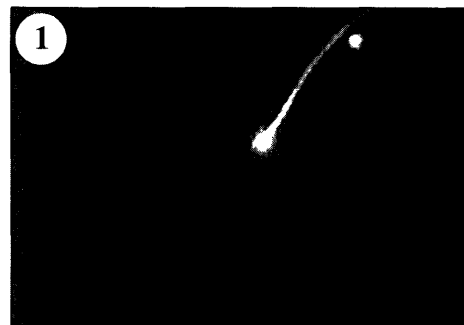
The August coup attempt showed both the ineptitude of Soviet leaders and the dangers that exist in the restructuring of the East. The senior leadership of most elements of the Soviet bureaucracy was so bankrupt of talent that its members could not seize the power that they supposedly already held as heads of that nation's security forces. Communications were not commandeered, troops were not moved, opponents were not rounded up. The coup was a totally unstellar performance, like much that preceded it. But the coup did reveal the vulnerability of societies seeking to rearrange basic political and economic processes. The confusion of restructuring provides opportunities for those being displaced to attempt to reassert their waning authority. It has been a near bloodless revolution, but because of this, much of the old guard still lurks dangerously close to the levers of power.

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December marked the end of the Soviet Union, the failed antagonist of the Cold War. The total collapse of this empire cannot be regretted given its awful history. The rejoicing was muted, however, because the collapse revealed painful truths to the world. Many of the components of the empire fell immediately into conflict with one another and internally as long suppressed ethnic hatreds found expression in territorial disputes. The temptation to war is fed by huge stockpiles of weapons — the legacy of the Cold War — and the realization that most of the freed peoples will live their lives in poverty — the legacy of communist policies of economic centralization and resource exhaustion.

Members of our program aided public understanding in the United States of these events, as is their charge. Barry Posen, a political scientist specializing in military affairs, participated in the national debate preceding the Gulf War and in the various evaluations that succeeded it. His informed analysis of U.S. military capabilities was in much demand as the conflict approached. Few analysts gave a more accurate prediction of the likely effects of American attempts at coercive diplomacy or of the war's actual conduct. Since the war, Professor Posen has focused his attention on developing a model for assessing regional military balances, an effort which, if successful, can help reduce the likelihood of similar conflicts breaking out by providing more realistic assessments of military capabilities among potential adversaries than is currently available.

Professor Theodore Postol was also involved in the assessment of the war, devoting most of his energies to an evaluation of the Patriot/Scud missile engagements. His studies took on special importance as advocates of strategic defense sought to use the apparent success of the Patriot as justification for an expanded Strategic Defense Initiative program including early deployment decision. Professor Postol's criticism of Patriot's effectiveness in the anti-ballistic missile mode generated much public debate not all of which, unfortunately, was fairly conducted. Congressional interest in the matter has allowed for a correcting of



the official record, however, with the Army reluctantly moving toward the position that Professor Postol had initially chosen.

I too have been involved in assessments of the war but from different angles than those noted above. In October I organized with the MIT Communications Forum a discussion of the role the media played in the war. Participating in the session were Deborah Amos of National Public Radio, Rick Davis of NBC, John Fialka of the Wall Street Journal, and Trudy Rubin of the Philadelphia Inquirer, all of whom having covered the war and buildup from Saudi Arabia, or, in the case of Rubin, from Iraq. Based on this discussion and other work, I have been examining the constraints that media presentations, casualties, and environmental damage have on the conduct of U.S. wars. The rapid, some would say premature, end of the Gulf War no doubt was at least in part due to political judgments about the public acceptability of increasing Iraq's military casualties and the reluctance of American military personnel to inflict them in such one-sided battles as were occurring in the waning hours of the war.

The breakup of the Soviet Union has led to much speculation about the state of Soviet military forces, the security of their equipment, and the survivability of important weapon production capabilities. Professor Stephen Meyer, the leader of our Soviet Security Studies Working Group, has been prominent in the public discussion of these issues, taking a more moderate position than many others in the universities who sought to comment publicly on them. As events have unfolded, there seems to be a lessening of concerns. The Soviet military has been more worried about housing than in exercising political power. So far, Soviet nuclear weapons have not become an obtainable commodity. And the Soviet military/industrial complex is but a shadow of itself, having lost many of its customers and almost all of its priority claims on resources.

The end of the Cold War causes painful adjustments in the United States as well as in the former Soviet

Union. Several of our key industries, but especially aerospace, are heavily dependent upon defense contracts. With the defense budget under increasing pressure, there is likely to be substantial cuts in both the procurement of military aircraft and military sponsorship of aerospace research and development activities. Together with the MIT Aeronautics and Astronautics Department, we have organized a faculty/graduate student working group to study the likely impact on the aerospace industry of these cutbacks and the consequences both for American competitiveness — the industry is our largest export earner — and America's ability to maintain its obvious great lead in military aviation, missiles, and the military use of space. Tens of thousands of jobs depend on wise adjustments to the obvious need to reduce defense spending.

A great strength of the MIT program is our knowledge of nuclear weapons issues. The events of 1991 are relevant here also. Had Saddam Hussein possessed but a few nuclear weapons the collective security action taken against him would likely have been much different from what it was. As was discussed, the breakup of the Soviet Union stimulates questions about the likelihood of Soviet nuclear weapons remaining with the republics and/or migrating to the Third World for individual or collective profit. The major nuclear powers have pledged to work to reduce their dependence on these weapons as others seem intent on acquiring them. Carl Kaysen, Marvin Miller, Jack Ruina and George Rathjens have participated in the various public discussions being held on nuclear proliferation, nuclear disarmament, and nuclear arms control. Professors Kaysen and Rathjens have raised the possibility of essentially abandoning the nuclear option. Dr. Miller and collaborators have looked at nuclear arms control in the Middle East. And Professor Ruina has continued his interest in strategic defenses and NATO-related problems. Add the work of Professors Postol and Meyer and it is obvious that this is a field that we cover quite extensively.

Appropriately the Program helped sponsor two symposia focused on nuclear issues. One, on reassessing

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tactical and strategic missile defense, was held on Capitol Hill in Washington, DC on October 29, 1991 and had extensive congressional staff and executive branch agency participation. It was jointly sponsored with the American Academy of Arts and Sciences and the Center for Science and International Affairs at Harvard. Funding was provided by the John D. and Catherine T. MacArthur Foundation. The other was an American-Israeli Seminar on Arms Control in the Middle East that Marvin Miller and Avner Cohen organized. It was held on February 6-7, 1992 at the American Academy of Arts and Sciences facility in Cambridge. Several Israelis participated, including members of the Knesset and leading strategic analysts. On the American side there was broad representation of academic, public interest, and government specialists on Middle Eastern arms control issues. Financial support for the seminar was provided by the Merck Fund, the Prospect Hill Foundation, and the Rockefeller Foundation.

Like those in industry and in the military, we also have to adjust to the Cold War's end. Not all of us have to stretch very hard for another career, however. George Rathjens has long had an interest in energy and environmental issues. His current work on the security implications of global change merely expands upon that interest. I have previously studied environmental and product risk controversies. It is only a

small step for me to examine the environmental risk legacies of the Cold War as I have been doing recently in studies of the cleanup effort in the nuclear weapons complex. Marvin Miller, in his affiliation with the Nuclear Engineering Department, has built a well-recognized expertise in energy issues which he continues to expand on several fronts. Jack Ruina, a Professor of Electrical Engineering we all should recall, is heading a major project on high resolution systems that involves the participation of telecommunications and media specialists throughout MIT. Perhaps the reach was a little longer for Steve Meyer, a Soviet forces expert who is now examining U.S. environmental regulation issues, but he has managed to do so quite effectively and with much local and national visibility.

No one should have the impression, however, that the Program faculty is moving away from security issues. We remain convinced that international security problems will require continuing attention and that scholarship and detached analysis can make important contributions to necessary public discussion of these problems. The Air Force recently disestablished the Strategic Air Command, the major instrument of U.S. power during the Cold War confrontation, but the Air Force did not give up either all of its bombers or its belief in strategic bombing. We are making individual and collective adjustments to a new reality,

but we have not given up on the need to study what air forces believe and when they should or should not be encouraged to behave according to their beliefs.

We did though pause to celebrate the end of the Cold War. With support from Dean Philip Khoury the Program organized a luncheon in June 1992 for MIT faculty to discuss both the factors



that led to the collapse of the Soviet Union and the likely shape of the world system after the Cold War. Nearly thirty faculty members attended what was billed as a farewell banquet for the Cold War, but what, due to its success, is to be the inaugural session in a series of interdisciplinary discussions of international security issues at MIT.

Celebrations aside, the end of the Cold War requires a rethinking of U.S. attitudes toward nuclear weapons. Les Aspin, chairman of the House Armed Services Committee and an MIT PhD, outlined some possible guiding concepts for U.S. nuclear policy in his well-received MIT Commencement Address on June 1, 1992. Joined by former MIT President Jerome Wiesner, several members of the DACS faculty held a lively post-address discussion with Congressman Aspin in which these concepts and other factors that might shape national defense strategies and budgets were explored.

The Annual Report gives me a public opportunity to thank my colleagues who made significant contributions to our teaching and research efforts. They include Professor Myron Weiner, the Director of the Center for International Studies; Professors Stephen Van Evera and Kenneth Oye with whom the Program faculty share many students; Professor Hayward Alker, the current President of the International Studies Association; Professor Lucian Pye, who will be missed as he takes retirement; Professor Nazli Choucri, who has demonstrated much initiative in starting environmental policy efforts at the Institute; Dean Philip Khoury, who has encouraged us to extend ties with the rest of the Institute; Professor Leon Trilling of the Aeronautics and Astronautics Department, who has helped organize one of our working groups; Professors Francis Ogilvie, Randolph Brooks, and Richard Celotto of the Ocean Engineering Department, who have helped us become more aware about naval issues; Dr. Steve Miller of the Harvard Kennedy School, who has always had time and encouragement for our students; and Professor Stephen

Rosen of the Olin Institute at Harvard who has helped develop joint projects.

Among the students, congratulations are due to the following recipients of grants or fellowships: Brian Taylor (Social Science Research Council graduate training fellowship in Russian and Soviet Studies, MacArthur Foundation summer grant for archival research in Moscow); Eric Labs and Matt Partan (John M. Olin Fellowships in National Security at the Center for International Affairs, Harvard); Brian Nichiporuk (Opportunity Grant from the Center for European Studies at Harvard for archival research at the Federal Military Archives in Freiburg, Germany); Jim Chung (U.S. Department of Education Foreign Language and Area Studies Fellowship); Judy Twigg (a fellowship from the Office of Air Force History); and Steve Flank (Institute for the Study of World Politics Fellowship). A special accolade goes to Jane Kellett, who was chosen to attend the 1992 New Faces Conference in Bellagio, Italy — the program, sponsored by the International Institute for Strategic Studies and the Arms Control Association, that brings together some of the most promising younger scholars in the field of international relations. I also wish to acknowledge the many contributions of DACS post-doctoral fellow George Lewis, who was awarded a Research and Writing Grant from the Program on Peace and International Cooperation of the John D. and Catherine T. MacArthur Foundation for research on the verification of non-strategic nuclear weapons.

We are grateful for the support provided by our several sponsors. In addition to the support previously listed, we received assistance from the Carnegie Corporation of New York, the William and Flora Hewlett Foundation, the John D. and Catherine T. MacArthur Foundation, the Ford Foundation, the W. Alton Jones Foundation, the Ploughshares Fund, Lincoln Laboratory, the MITRE Corporation, and the U.S. Department of Energy.

Harvey M. Sapolsky

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FACULTY



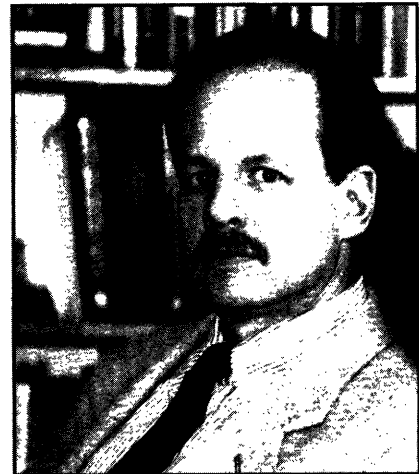
HARVEY M. SAPOLSKY is Professor of Public Policy and Organization in the Department of Political Science and Director of both the Defense and Arms Control Studies Program and the MIT Communications Forum. Dr. Sapolsky completed a B.A. at Boston University and earned an M.P.A. and Ph.D. at Harvard University. He has worked in a number of public policy areas, notably health, science, and defense where he examines the effects of institutional structures and bureaucratic politics on policy outcomes. In defense he has served as a consultant to the Commission on Government Procurement, the Office of the Secretary of Defense, the Naval War College, the Office of Naval Research, and the RAND Corporation, and has lectured at all of the service academies. He is currently focusing his research on interservice and civil/military relations. In July 1989 he succeeded Professor Ruina as Director of the MIT Defense and Arms Control Studies Program. Professor Sapolsky's most recent defense-related book is titled *Science and the Navy*, and is a study of military support of academic research. A volume on telecommunications policy he co-edited has just appeared.

CARL KAYSEN is David W. Skinner Professor of Political Economy Emeritus in the Program in Science, Technology, and Society and a Senior Lecturer at the MIT Center for International Studies. Dr. Kaysen earned his B.A. in Economics at the University of Pennsylvania, and his Ph.D. at Harvard Univer-



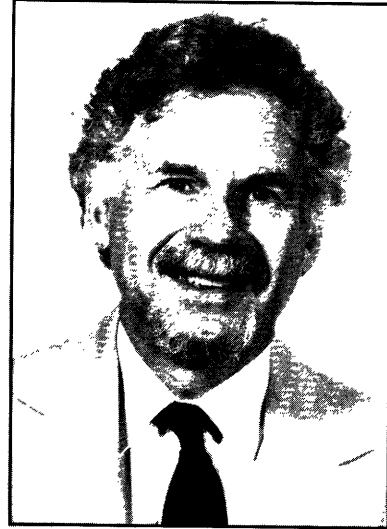
sity, where he was an economics professor from 1950-1966. From 1966 until 1976, when he came to MIT, he was Director of the Institute for Advanced Study in Princeton and from 1961-1963 he was the Deputy Special Assistant for National Security Affairs to President Kennedy. He has served as a consultant to RAND, the Defense Department, and the CIA. A member of the Committee on Security Studies of the American Academy of Arts and Sciences, Dr. Kaysen is currently engaged in organizing a project under the Committee's auspices on emerging norms of justified international intervention.

STEPHEN M. MEYER is Professor of Defense and Arms Control Studies and Director of Soviet Security Studies at MIT. Prior to joining the MIT faculty in 1979, he was a post-doctoral fellow at Harvard University's Center for Science and International Affairs. He received his Ph.D. at the University of Michigan, Ann Arbor in 1978. Dr. Meyer's areas of particular interest are defense decision-making, military economics, force planning and analysis, and arms control in the former Soviet Union. His current work examines the rise and fall of Soviet military power and the ways in which domestic organizations and institutions influenced Soviet defense policy. Dr. Meyer serves as an advisor on Soviet security affairs to several U.S. government agencies and has testified numerous times in open and closed hearings before the House Armed Services Committee, the Senate Armed Services Committee, the Senate Foreign Relations Committee and the Senate Select Committee on Intelligence.



FACULTY

MARVIN M. MILLER is a Senior Research Scientist in the Department of Nuclear Engineering and a senior staff member of the MIT Center for International Studies. After undergraduate work at the City College of New York he earned an M.A. in Physics from the University of Rochester and a Ph.D. in Electrical Engineering from the Polytechnic Institute of New York. Prior to joining MIT in 1976, Dr. Miller was an associate professor of electrical engineering at Purdue University working on laser theory and applications. His current research interests are arms control, particularly nuclear proliferation, and the environmental impacts of energy use. He has studied proliferation issues since 1977, including both country-specific and generic problems. In the former, his main interests are in the Middle East and South Asia, while in the latter he has concentrated on international safeguards and export controls for sensitive nuclear technologies. From 1984 to 1986, Dr. Miller was a Foster Fellow with the Nuclear Weapons and Control Bureau of the U.S. Arms Control and Disarmament Agency (ACDA) and is currently a consultant on proliferation issues for ACDA, the International Technology Program of the Los Alamos National Laboratory, and the Technical Support Organization at the Brookhaven National Laboratory.

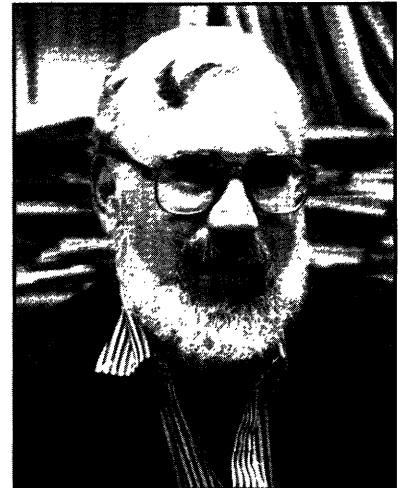


BARRY R. POSEN is Professor of Political Science. His most recent book, *Inadvertent Escalation*, was released from Cornell University Press in Fall, 1991. His first book, *The Sources of Military Doctrine*, won the American Political Science Association's Woodrow Wilson Foundation Book Award for the best book published in political science in 1984, and Ohio State University's Edward J. Furniss Jr. Book Award for the best first book in the field of security studies. Dr. Posen did his undergraduate work at Occidental College and

his graduate work at the University of California at Berkeley, where he earned an M.A. and Ph.D. Prior to coming to MIT, Dr. Posen was Assistant Professor of Politics and International Affairs at Princeton University. He has also held a number of prestigious positions: Guest Scholar at the Brookings Institution; Post-Doctoral Fellow at the Center for International Affairs at Harvard; Council on Foreign Relations International Affairs Fellow; Rockefeller Foundation International Affairs Fellow and Guest Scholar at the Georgetown Center for Strategic and International Studies; and Woodrow Wilson Center Fellow, Smithsonian Institution. Dr. Posen's current activities include work on U.S. military strategy and force structure, regional military balance assessment, and nationalism.

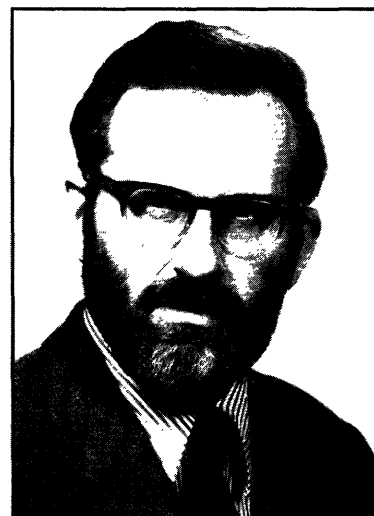
FACULTY

THEODORE A. POSTOL is Professor of Science, Technology and National Security Policy in the Program in Science, Technology, and Society at MIT. He did his undergraduate work in Physics and his graduate work in Nuclear Engineering at the Massachusetts Institute of Technology. After receiving his Ph.D., Dr. Postol joined the staff of Argonne National Laboratory, where he used neutron, x-ray and light scattering, along with computer molecular dynamics techniques, to study the microscopic dynamics and structure of liquids and disordered solids. Subsequently he went to the Congressional Office of Technology Assessment to study methods of basing the MX Missile, and later worked as a scientific adviser to the Chief of Naval Operations. After leaving the Pentagon, Dr. Postol helped to build a program at Stanford University to train mid-career scientists to study developments in weapons technology of relevance to defense and arms control policy. In 1990 Dr. Postol was awarded the Leo Szilard Prize from the American Physical Society.



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GEORGE W. RATHJENS became Professor in the Department of Political Science after service with the Institute for Defense Analyses, the U.S. Arms Control and Disarmament Agency, the Advanced Research Projects Agency of the Department of Defense, the Office of the President's Science Advisor, and the Weapons Evaluation Group of the Department of Defense. Dr. Rathjens received his B.S. from Yale University and completed his Ph.D. in chemistry at the University of California at Berkeley. He is active in a number of associations, including the Council for a Livable World of which he has been Chairman and the Federation of American Scientists of which he is Sponsor, Councilor, and Past Chairman. Dr. Rathjens' major policy interests are nuclear arms issues, post-Cold War international security questions, and environmental problems, with special emphasis on conflict and the environment.



JACK RUINA is Professor of Electrical Engineering. Dr. Ruina was an undergraduate at the City College of New York and did his graduate work at the Polytechnic Institute of Brooklyn, earning his M.E.E. and D.E.E. there. He taught at Brown University and the University of Illinois; at the latter he also headed the Radar Division of the Control System Laboratory. While on leave from the University of Illinois, he served in several senior positions at the Department of Defense, the last being Director of the Advanced Research Projects Agency. He also held the post of President of the Institute for Defense Analyses. At MIT, he has held the position of Vice President for Special Laboratories and is currently Secretary of the MIT Faculty. He was instrumental in establishing the Defense and Arms Control Program and was its first Director. Dr. Ruina's special interest is in strategic weapons policy.

DACS SEMINARS. The DACS seminar series provides a forum for discussing current security topics and the varying disciplinary perspectives on security studies. The sessions are open to the wider MIT and Boston area communities. Each is followed by a reception which allows graduate students and faculty members to meet informally with the speakers.

Fall 1991

September 24 — Col. Daniel Kaufman

Professor and Deputy Head, Social Sciences Department, U.S. Military Academy, West Point, "The Army in Transition"

October 1 — Dr. Thomas McNaugher

Senior Fellow, Brookings Institution, "The Endless End Game: U.S. Strategy in the Wake of the Gulf War"

October 8 — Dr. Kevin Lewis

Senior Staff, RAND Corporation, "U.S. Force Structure Post Gulf, Post Cold War"

October 22 — Col. James McDonough

Director, School of Advanced Military Studies, Fort Leavenworth, "Development of Future Military Doctrine"

October 29 — Clark Murdock

Staff, House Armed Services Committee, U.S. Congress
"Implications of the Gulf War for Restructuring the Military"

November 6 — Gen. Frederick Woerner, USA (Ret.)

Professor, Political Science Department, Boston University, "A Southern Strategy"

November 12 — Dr. David Morrison

Technical Director, Energy, Resource and Environmental Systems Division, MITRE Corporation, "For the Common Good: Chemical Stockpile Destruction"

November 19 — Edward Kolodziej

Professor, Political Science Department, University of Illinois, "Comparative Strategic Analysis: A Critique of Walt"

November 26 — Michael Telson

Staff, House Budget Committee, U.S. Congress, "Defense Spending and the Federal Budget Process"

December 3 — Stephen Van Evera

Professor, Political Science Department, MIT, "Security Orders for the New Europe"

Spring 1992

February 12 — Theodore Postol

Professor of Science, Technology and National Security Policy, MIT, "The Gulf War Experience with Patriot"

February 19 — Thomas Hughes

Professor of History and Sociology of Science, University of Pennsylvania, "MIT as a System Builder: The History of the SAGE Air Defense System"

February 26 — Charles Zraket

Scholar in Residence, Kennedy School of Government, Harvard University, "Post-Cold War Restructuring of U.S. Defense"

March 4 — Ernst Frankel

Professor of Ocean Engineering, MIT, "How to Procure Top Quality, High Performance Naval Ships at Half Price"

March 11 — Benoit Morel

Professor of Engineering and Public Policy, Carnegie-Mellon University, "Verifying Production Bans on Chemical Weapons"

March 18 — Catherine M. Kelleher

Senior Fellow, The Brookings Institution, "Germany in the New World Order"

April 1 — Alan Bernard

Group Leader, Systems and Analysis Group, Lincoln Laboratory, "Analyzing Air Defense Performance"

April 8 — Edward Crawley

Professor of Aeronautics and Astronautics, MIT, "United States-'Soviet' Space Cooperation"

April 15 — J. David Kramer

Consulting Scientist, The MITRE Corporation, "Can Ultra-Wideband Radar Detect Small Radar Cross-Section Targets?"

April 22 — John Friedman

Lead Engineer, The MITRE Corporation, "Fiber Optics"

April 29 — Frank Von Hippel

Director, Center for Energy and Environmental Studies, Princeton University, "Dismantling Soviet Nuclear Weapons"

TECHNOLOGY SEMINARS

Technology, Defense and Arms Control in a Changing World. This seminar series provides an opportunity for scientifically knowledgeable individuals in the Boston area to join with program faculty and students in examining technical topics of current policy relevance.

Fall 1991

SEMINAR SERIES

September 25 — Ray Kidder

Laboratory Associate, Lawrence Livermore National Laboratory, "Do We Need to Continue Nuclear Testing?"

October 2 — Richard Hallion

Issues and Policy Analyst, The Air Staff, "Lessons of the Gulf Air War"

October 9 — Harold Nelson

Brigadier General, Chief of Military History, U.S. Army, "The Ground Campaigns of the Gulf War"

October 16 — George Ullrich

Deputy Director, Defense Nuclear Agency, "Nuclear Proliferation in the Third World"

October 23 — Barry Horowitz

Chief Executive Officer, The MITRE Corporation, "Modernizing and Maintaining DOD Software Base"

October 30 — Cindy Williams

Department Head of Strategic Air Command Systems, The MITRE Corporation, "How the U.S. Builds Command Centers"

November 6 — Dean Wilkening

Senior Researcher, The RAND Corporation, "Nuclear Force Targeting Objectives After START"

November 13 — Frank Shackford

Associate Department Head of Strategic Surveillance Systems, The MITRE Corporation, "U.S. Radar Early Warning Sensors: BMEWS and PAVE PAWS"

November 20 — Mark Munson

Assistant Chief, Portal Monitoring Division, On-Site Inspection Agency, "On-Site Inspection of Missile Production and Assembly Facilities"

December 4 — Chien-Ching Cho

Lead Scientist, The MITRE Corporation, "Measuring Vulnerabilities to ASAT Attack"

DEFENSE SCIENCE SEMINARS. The Defense Science Seminar Series was begun in 1986 to explore issues relating defense technology to defense policy and arms control. Participants in the seminars include faculty, leaders in high technology firms, scientists and engineers, and advanced graduate students. The sessions have provided an opportunity to share ideas and perspectives on issues just at the horizon of policy concern.

November 13, 1991 — The Hon. David S.C. Chu

Assistant Secretary of Defense for Program Analysis and Evaluation, "The Role of Analysis in Formulating Defense Policy"

SPECIAL SEMINARS

October 17, 1991 — "Reporting the Gulf War"

Panel of four journalists, representing print, TV and radio, discuss military/press relationships during the Gulf War

Harvey Sapolsky, Moderator

October 31, 1991 — Scott Sagan

Assistant Professor of Political Science, Stanford University, "Organizations, Accidents, and Nuclear War"

November 21, 1991 — Lt. Gen. Rolf Huttel

German Representative to NATO's Military Committee

Ambassador Gregorio de Faria

Portugal's Permanent Representative to NATO, "The Future of the Atlantic Alliance"

December 12, 1991 — Arthur Alexander

President, Japan Economic Institute of America, "The Japanese Defense Industries"

February 27, 1992 — Ross Mirkarimi

Member, International Commission on the Gulf Crisis (Harvard Study Team), "Environmental Impact of the Gulf War"

April 13, 1992 — Kenneth Pollack

Doctoral student, MIT Political Science Department, "Iraqi Strategy and Operations During the Gulf War"

April 14, 1992 — James Womack

Co-author of *The Machine That Changed the World*, "The Collapse of General Motors"

The working groups bring together, on a regular basis, faculty and students interested in examining a focused topic through individual and collaborative projects. Group sessions include research reviews, thesis presentations, guest speakers, and research design efforts. All groups report on their progress in the spring at a DACS symposium.

AEROSPACE INDUSTRY

Aerospace is America's competitive advantage, militarily and commercially. Consider the role aviation played in the Gulf War and its importance in our balance of trade. Aerospace is also an industry that has been heavily dependent upon military purchases for its development. With the end of the Cold War this dependency is bound to be reduced. The working group will examine the industry's future opportunities in light of declining military needs and increased trade rivalry. (Offered jointly with members of the Aeronautics and Astronautics Department.)

Harvey Sapolsky and Leon Trilling, Working Group Leaders

CONVENTIONAL FORCES

The Conventional Forces working group explores military capabilities, doctrines, and strategies for non-nuclear forces. The group's recent work on armored breakthrough battles has been used to develop an understanding of the determinants of success in modern, high-intensity, air-land warfare. This in turn supports analysis of regional military balances including the determinants of military stability among states armed with mechanized ground forces supported by modern tactical air power.

Barry Posen, Working Group Leader

DEFENSE/ENVIRONMENTAL PROBLEMS

Wars cold and hot have environmental impacts. This working group is concerned with efforts to prevent, reduce, and clean up the environmental effects of military activities from weapon development to warfare. This year's topic is the management of the nuclear weapons production clean-up project. The group will compare the DOE management problem with that of other government large-scale projects. (Offered in conjunction with the MIT Energy Laboratory.)

Harvey Sapolsky, Working Group Leader

DEFENSE POLITICS

Rising budgets, declining budgets, there is always room for politics in defense. This working group will continue its exploration of interservice and civil-military relations. Among the topics to be considered are the neglected missions problem, the military's role in good samaritan tasks at home and abroad, and the ways domestic politics shape the conduct of war.

Harvey Sapolsky, *Working Group Leader*

NEW DIRECTIONS IN INTERNATIONAL SECURITY AND DEFENSE POLICY

Organized to respond to the rapidly changing world events of the last several years—the end of the Cold War, the repudiation of communism in the Soviet empire and its disintegration—the “New Directions” working group focuses on the varying threats to international security, with emphasis on U.S. interests and relevant military requirements. The Gulf War, the Middle East situation, and the crisis in Yugoslavia will illuminate questions regarding the role of nuclear weapons and conventional forces in the “new world.” Of special concern is the feasibility of the International Court of Justice, the U.N., and regional institutions in adjudicating disputes, deciding when to employ military or other sanctions to deal with unacceptable behavior, and in peace-keeping.

George Rathjens and **Jack Ruina**, *Working Group Leaders*

SOVIET SECURITY STUDIES

The oldest of the working groups, and a special research unit of the DACS Program, the Soviet Security Studies working group explores the rapidly changing political conditions under which the Soviet Union formulates its security strategies. Recent research has focused on an effort aimed at examining Soviet defense economic decisionmaking in the 1990s.

Stephen Meyer, *Working Group Leader*

TECHNICAL STUDIES IN DEFENSE AND ARMS CONTROL POLICY

The “Technical Studies” working group attempts to use its scientific and technical expertise to examine the implications of weapons technology by assessing the military capability of new weapons systems and evaluating the potential influence of these capabilities for security planning. Based on the Gulf War, the group has been examining the effectiveness of the Patriot and Hawk against tactical ballistic missiles. Ongoing research includes studies of the technology and effectiveness of missile defense systems, arms control for nuclear cruise missiles, and nuclear targeting strategies for smaller nuclear arsenals.

Theodore Postol, *Working Group Leader*

- Avner Cohen and Marvin Miller,
“Defusing the Nuclear Mideast,”
op-ed piece, *The New York Times*, May 30, 1991.
- Avner Cohen and Marvin Miller,
“How to Hatch Arms Controls,”
op-ed piece, *The Jerusalem Report*, June 6, 1991.
- Avner Cohen and Marvin Miller,
“How Close to Midnight? A Retrospective View of the Gulf War Nuclear Threat,” *Bulletin of the Atomic Scientists* (July/August 1991).
- Avner Cohen and Marvin Miller,
“Nuclear Arms Control in the Middle East: A Post Gulf War Perspective,” *The New Outlook*, Special Issue on Nuclear Proliferation in the Middle East (Fall 1991).
- Owen Cote, “The Trident and the Triad: Collecting the D-5 Dividend,” *International Security* (Fall 1991).
- Neta C. Crawford, “Once and Future Security Studies,” *Security Studies* (Winter 1991).
- Carl Kaysen, book review of *The Crisis Years: Kennedy and Khrushchev, 1960-1963*, by Michael R. Beschloss, in *Political Science Quarterly* (Spring 1992).
- Carl Kaysen, Robert S. McNamara, and George W. Rathjens,
“Nuclear Weapons After the Cold War,” *Foreign Affairs* (Fall 1991).
- Eric J. Labs, “Do Weak States Bandwagon?” *Security Studies* (Spring 1992).
- George Lewis and Theodore Postol,
“SLCMs — Ignored, Then Stored,” *Bulletin of the Atomic Scientists* (November 1991).
- Katherine Magraw and Christopher Paine, book review of *Congress and Nuclear Weapons*, by James Lindsay, in *Technology Review* (January 1992).
- Stephen M. Meyer, “The Transformation of Soviet Military Power,” in Robert Legvold and Timothy Colton, editors, *After the Soviet Union: From Empire to Nations* (forthcoming, 1992).
- Stephen M. Meyer, “Environmentalism Doesn’t Steal Jobs,” op-ed piece, *The New York Times*, March 26, 1992.
- Stephen M. Meyer, “How the Threat (and the Coup) Collapsed: The Politicization of the Soviet Military,” *International Security* (Winter 1991/92).
- Stephen M. Meyer, “Hyping the Soviet Nuclear Peril,” op-ed piece, *The New York Times*, December 12, 1991.
- Stephen M. Meyer, “Key Questions for Soviet Studies,” point of view piece, *The Chronicle of Higher Education*, September 4, 1991.
- Paul N. Nagy, “So Where Were All the RO/ROs?” *Naval Institute Proceedings* (May 1992).

- Barry R. Posen, "Military Lessons of the Gulf War: Implications for Arms Control in the Middle East," Jaffee Center Publication Series (forthcoming in an edited volume).
- Barry R. Posen, *Inadvertent Escalation: Conventional War and Nuclear Risks* (Cornell University Press, 1991).
- Barry R. Posen, "Military Mobilization in the Persian Gulf Conflict," in *SIPRI Yearbook 1991: World Armaments and Disarmament* (Oxford: Oxford University Press, 1991).
- Theodore A. Postol, "The Gulf War Performance of Patriot and Future Issues for Theater Missile Defenses," *Security Studies* (forthcoming, 1992).
- Theodore A. Postol, "Lessons of the Gulf War Experience with Patriot," *International Security* (Winter 1991/92).
- Theodore Postol and Reuven Pedatzur, "The Patriot Is No Success Story," commentary, *Defense News*, December 2, 1991.
- Theodore A. Postol, "Whoops! Patriot Missile Sputters," op-ed piece, *The San Diego Tribune*, July 18, 1991.
- George W. Rathjens, "The Go-It-Alone Illusion," *Bulletin of the Atomic Scientists* (May 1992).
- George W. Rathjens and Marvin M. Miller, "Nuclear Proliferation After the Cold War," *Technology Review* (August/September 1991); reprinted in *Global Issues* 92/93.
- George W. Rathjens, "Global Warming: Storm Clouds Ahead," *International Journal of Humanities and Peace* (Summer 1991).
- George W. Rathjens, "Energy and Climate Change," in Jessica Tuchman Mathews, editor, *Preserving the Global Environment* (New York: Norton, 1991).
- Laura W. Reed, book review of *The Sun Never Sets*, edited by Bruce Birchard and Joseph Gerson, in *Nuclear Times* (Summer 1991).
- Jack Ruina, book review of *Teller's War: The Top Secret Story Behind the Star Wars Deception*, by William J. Broad, in *Arms Control Today* (May 1992).
- Jack Ruina, book review of *A Path Where No Man Thought: Nuclear Winter and the End of the Arms Race*, by Carl Sagan and Richard Turco, in *Nature* (29 August 1991).
- Harvey M. Sapolsky, book review of *Military Organizations, Complex Machines*, by Chris Demchak, in *American Political Science Review* (June 1992).
- Harvey M. Sapolsky, et al., editors, *The Telecommunications Revolution: Past, Present and Future* (London and New York: Routledge, 1992).
- Harvey M. Sapolsky and Owen Cote, "Major Subsidy Boost Not Required to Maintain Adequate Sealift," op-ed piece, *Defense News*, August 19, 1991.
- Harvey M. Sapolsky, book review of *The Democratic Wish: Popular Participation and the Limits of American Government*, by James A. Morone, in *Journal of Health Politics, Policy and Law* (Winter 1991).
- Judyth Twigg, "The Anti-Expenditure Principle: Gosplan's Proposals for Soviet Economic Reform," *Soviet Studies* (September 1991).
- Judyth Twigg, "The New World Order: New Hope for American Weapons Procurement Reform?" *Ripon Society Forum* (July 1991).
- Sharon K. Weiner and Patrick J. Garrity, "U.S. Defense Strategy After the Cold War," *The Washington Quarterly* (Spring 1992).

WORKING PAPERS

Stephen M. Meyer, Professor of Defense and Arms Control Studies, MIT, "U.S. Interests in the Soviet Future: The Power of the Soviet Military"—Testimony Before the Senate Foreign Relations Committee, Subcommittee on European Affairs (DACS WP #91-3), June 1991.

Brian Nichiporuk, Doctoral candidate in political science, MIT, "The Pivotal Power: America in the 1990s" (DACS WP #91-2), May 1991.

Theodore A. Postol, Professor of Science, Technology and National Security Policy, MIT, "The Prospects for Successful Air-Defense Against Chemically-Armed Tactical Ballistic Missile Attacks on Urban Areas" (DACS WP #91-1), March 1991.

Stephen Van Evera, Assistant Professor of Political Science, MIT, "Managing the Eastern Crisis: Preventing War in the Former Soviet Empire" (DACS WP #92-1), January 6, 1992.

SPECIAL SEMINAR NOTES

"Reporting the Gulf War," a panel of four journalists representing print, TV and radio discuss military/press relationships during the Gulf War (moderated by Harvey Sapolsky), October 17, 1991.

RESEARCH JOURNAL

Breakthroughs Vol. I, No. 2
Spring 1991

Breakthroughs Vol. II, No. 1
Spring 1992

RESEARCH NOTES

Soviet Defense Notes

A publication of the Soviet Security Studies Working Group, published approximately six times a year.

DACS SEMINAR NOTES

Summaries of the DACS Seminars held during the 1991-1992 academic year.

DACS FACULTY

OUTSIDE PROFESSIONAL ACTIVITIES • 1991/1992

CARL KAYSEN

- Spent the Fall 1991 term at the Institute for Scientific Interchange in Torino, Italy.
- Attended conference of Italian physicists on disarmament at Castiglione Cello, November 1991.
- Lectured at European University Institute in Florence, Italy on "U.S. Policy Toward Europe, 1961-63," November 1991.
- Visited Warsaw and met with a seminar at the Institute of Political Sociology, Warsaw University and with the Director of Intelligence and Research at the Polish Foreign Office, November 1991.
- Attended Pugwash Conferences on Science and World Affairs, December 14-16, 1991, in London, England.

STEPHEN M. MEYER

- Gave testimony before the Senate Foreign Relations Committee/ Subcommittee on European Affairs hearing on "U.S. Interests in the Soviet Future: The Power of the Soviet Military," on June 6, 1991.
- Attended a luncheon/strategy session with President Bush in Kennebunkport, Maine on July 6, 1991.
- Spoke on "Soviet Nuclear Forces" at Los Alamos National Laboratory, July 26, 1991.
- On August 22, 1991, was quoted in *The New York Times* under the heading, "Voices of Experts: Moribund Communism Draws Its Last, Ragged Breaths."
- Spoke on "The Control of Nuclear Weapons in the Soviet Union" at a Department of Energy conference held August 27, 1991 in Washington, DC. Also gave interviews on this subject to the BBC and Voice of America.
- On August 30, 1991, gave a talk on "The Soviet Coup" at the National Security Managers Seminar (a program composed of 100 U.S. colonels and generals), sponsored by the Kennedy School, Harvard University.
- Discussed "Models of Soviet Decision-Making" as guest speaker at the September 7-8, 1991 session of Seminar XXI, held in Washington, DC. (Seminar XXI is the MIT educational program designed for senior members of the foreign and national security policy community.)
- Took part in MIT's annual Family Weekend, held October 18-19, 1991, participating in a panel discussion on "The Political and Economic Implications of Recent Developments in the Soviet Union."
- On October 30, 1991, in Washington, DC, gave a talk on "conversion" at a workshop on the USSR organized by the World Bank.
- Participated in a workshop on "The Future of Soviet Nuclear Forces," sponsored by the Carnegie Corporation of New York on November 1, 1991, hosted by the Center for Science and International Affairs, Harvard University.
- Gave a talk on "The Soviet Union: Going to Hell in a Hand Basket," as guest speaker at a November 18, 1991 luncheon for the MIT Association for Retired Persons.
- Participated in a Washington Roundtable meeting sponsored by the Center for Strategic and International Studies on February 5, 1992.

- Spoke on the nature of the security risk arising from the current Soviet political/military situation at a colloquium on the (former) Soviet Union organized by The World Bank, held February 27-28, 1992 in Washington, DC.
- On April 3, 1992, took part in the MIT Campus Visit program (organized by the MIT Development Office), delivering a talk on "The Impact of the Military in the Post-Soviet States."

MARVIN M. MILLER

- Gave a talk on "Prospects for Nuclear Arms Control in the Middle East" at the Jaffee Center for Strategic Studies, Tel-Aviv University in Israel, August 1991.
- Spoke on the human dimensions of the proliferation problem at a conference on "Non-Proliferation: Problems and Prospects," held at Arlie House, VA in November 1991, sponsored by SAIC Corporation.
- Participated in a December 1991 workshop on "Arms Control and the Arab-Israeli Peace Process," sponsored by the Carnegie Endowment for International Peace, at the Bellagio Conference Center in Italy.
- Organized a DACS-sponsored U.S./Israeli workshop on arms control in the Middle East, held at the American Academy of Arts and Sciences in Cambridge, MA, February 1992.
- In February 1992, attended Advisory Panel Meeting for U.S. Office of Technology Assessment (OTA) Study of Proliferation of Weapons of Mass Destruction.
- Participated in a conference on "Strengthening the Nuclear Non-Proliferation Regime," March 1992, sponsored by the Carnegie Endowment for International Peace.
- Organized a seminar at MIT on "Global Climate Change," — in honor of the late Professor David Rose — sponsored by Technology and Culture Seminar, June 1992.
- Attended Visiting Committee Meeting for Department of Nuclear Energy, Brookhaven National Laboratory, June 1992.
- During June 1992, gave a talk on reactor and glassification options for disposal of plutonium from dismantled nuclear weapons, at Lawrence Livermore National Laboratory and at the Workshop on Problems of Disposal of Plutonium Recovered from Retired Nuclear Weapons, held in Bonn, Germany.
- Attended July 1992 steering committee meeting of the American Association for the Advancement of Science (AAAS) Project on Future Security Arrangements in the Middle East.

BARRY R. POSEN

- On May 10-12, 1991, was a special guest at the Seminar XXI session on "Trade, Technology and Security" held at the Aspen Institute, Maryland. (Seminar XXI is the MIT educational program designed for senior members of the foreign and national security policy community.)
- Was a discussant at the American Academy of Arts and Sciences conference, "Restraining the Middle East Arms Race: Post-Gulf War Prospects," held June 6-8, 1991.
- Participated in the Wianno Club Conference on National Strategy, Cape Cod, on June 13-15, 1991, sponsored by Harvard's Olin Institute for Strategic Studies.
- On July 25, 1991, spoke on "Military Lessons from the Persian Gulf War" as part of the MIT Campus Visit (an MIT Development Office program).
- Gave a presentation at the National Security Studies Curriculum Review Conference, July 1991.

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**OUTSIDE
PROFESSIONAL
ACTIVITIES**

- Was a discussant at the Naval War College's First Annual Force Planning Conference on "Strategy and Forces for a Changing Security Environment," held in Newport on August 14-16, 1991.
- Gave a lecture on "U.S. Defense Priorities in the 1990s" at the Kennedy School Program for Soviet General Officers, Harvard University, on September 19, 1991.
- On September 30, 1991, his reactions to President Bush's speech calling for unilateral reductions in nuclear arsenals were aired on *Monitor News* (Channel 68-TV).
- Spoke on "Nationalism and the Mass Army" at a National Research Council workshop on Nationalism and War (organized by the NAS Commission on Behavioral and Social Sciences and Education), held November 14-15, 1991 in Washington, DC.
- Gave a talk on "Military Lessons of the Gulf War: Implications for Arms Control" at an international workshop on Arms Control and the New Middle East Security Environment, held January 5-10, 1992 in Israel, sponsored by the Jaffee Center for Strategic Studies, Tel Aviv University.
- As military expert for Monitor TV, appeared on the *Monitor News* broadcast of January 16, 1992 to discuss the Gulf situation 'one year later.'
- Gave a February 28, 1992 talk on "The Lessons of the Gulf War for Regional Military Balance Assessment" as part of the Tankard Seminar series sponsored by the MIT Ocean Engineering Department.
- During February 1992, reviewed for PBS a preliminary version of a WGBH-produced *NOVA* television documentary on strategic bombing.
- Spoke on "Future U.S. Force Structure" at a seminar on national security policy for Congressional staff sponsored by the Stanley Foundation, held March 3, 1992 at Annapolis, Maryland.
- On March 6, 1992, gave a presentation at the Stanley Foundation Foreign Policy Forum.
- Lectured on Nationalism at a meeting of MIT's (undergraduate) Burchard Scholars on April 1, 1992.
- Discussed Saddam Hussein's movement of surface-to-air missiles to the Kurdistan border on the *Monitor News* (Ch. 68-TV) broadcast of April 8, 1992.
- Gave a presentation on military formats and regional balance assessment at the National Security Fellows Faculty Seminar Program, the Kennedy School, Harvard University, April 10, 1992.
- Attended a breakfast meeting with General Gordon Sullivan, U.S. Army Chief of Staff, to discuss potential army responses to the defense budget drawdown. The session, held April 14, 1992 at the Harvard Faculty Club, was organized by Gen. Bernard Trainor of The Kennedy School.

THEODORE A. POSTOL

- On April 16, 1991, testified before the Armed Services Committee of the U.S. House of Representatives on the lessons for SDI from the Gulf War experience with the Patriot missile.
- Was a discussant at the Naval War College's First Annual Force Planning Conference on "Strategy and Forces for a Changing Security Environment," held in Newport on August 14-16, 1991.
- Spoke on "The Gulf War Experience with Patriot" at a National Security Seminar held at Harvard University's Olin Institute for Strategic Studies, September 30, 1991.
- Testified on "Policy Issues for Theater Missile Defenses in a Shrinking Budget" at a workshop on implications of tactical and strategic defenses for U.S. security and the ABM Treaty, U.S. House of Representatives, October 29, 1991.
- Gave a seminar talk during MIT's Independent Activities Period on Patriot effectiveness, sponsored by the Program in Science, Technology, and Society, on January 10, 1992.
- Participated in a Union of Concerned Scientists Workshop on Limited Ballistic-Missile Defense, Washington, DC, January 21, 1992.

- Spoke at American Association for the Advancement of Science annual meeting, Chicago, February 1992.
- As Advisor to the House Government Operations Committee investigation into Patriot's performance in the Gulf War, gave testimony on two occasions before the Committee: "Improper Use of the Classification System to Suppress Public Debate on the Gulf War Performance of the Patriot Air-Defense System" (March 18, 1992); "Optical Evidence Indicating Patriot High Miss Rates During the Gulf War" (April 7, 1992).
- Was speaker at Stanford University Center for International Security and Arms Control, April 10, 1992.
- Gave a talk on "The Strategic Forces of Russia and the U.S." at Stanford Medical School, April 11, 1992.
- Spoke on "Gulf War Experience with Patriot" at Fermi National Accelerator Laboratory, May 20, 1992.
- Made the following media appearances regarding the Patriot missile controversy:
ABC-TV National News (1/16/92 and 4/7/92)
MacNeil/Lehrer News Hour [PBS] (1/27/92)
WCVB-TV News, Boston (1/24/92 and 4/6/92)
Nightline [ABC-TV] (4/6/92)
Fox-TV News, Washington, DC (4/7/92)
Adventure Science [SDR-German TV] (taped 4/3/92)
Monitor Radio (1/92)
Talk of the Nation [NPR] (1/16/92)

GEORGE W. RATHJENS

- Testified on U.S. nuclear weapons policy before the Senate Foreign Relations Committee, September 25, 1991.
- Attended Pugwash Conferences on Science and World Affairs, December 14-16, 1991, in London, England.
- Lectured on nuclear proliferation at Hampshire College, Amherst, MA, on January 15, 1992.
- Presented paper titled "Nuclear Deterrence: Where Are We Now?" at the Australian National University (Peace Research Centre) and at the University of Western Australia (Indian Ocean Centre for Peace Studies), June 1992.

JACK RUINA

- Gave a talk titled "On SDI, Patriot and the ABM Treaty" at the Pugwash Workshop held in Geneva, June 6, 1991.
- On June 24, 1991, spoke to the MIT Alumni Club of Italy, in Milan, on "Prospects for Arms Control."
- Attended Pugwash Conferences on Science and World Affairs, December 14-16, 1991, in London, England.
- Spent January 1992 in San Diego as a visiting scholar at the University of California's Institute on Global Conflict and Cooperation.

HARVEY M. SAPOLSKY

- Was a 'round-table' at a conference on "A Possible 'Fifth Geneva' Convention on the Protection of the Environment in Time of Armed Conflict," organized by Greenpeace International, the London School of Economics, and the University of London's Centre for Defence Studies, held June 3, 1991.
- On October 9, 1991, spoke to the Advanced Concepts Committee at Lincoln Laboratory on current and future security studies at MIT.
- Described the factors affecting the support of science in the United States to a delegation of Russians considering the establishment of a Russian

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**OUTSIDE
PROFESSIONAL
ACTIVITIES**

- Republic Science Foundation. The delegation, which visited MIT on October 24, 1991, was led by Dr. Gennady Kochetkov of the Institute of the USA and Canada and included representatives from several Soviet institutes and Russian state and legislative committees.
- Gave a presentation on December 10, 1991 titled "Science Funding After the Cold War" in the MIT Faculty Workshop Series on University Science and the Federal Government.
 - On January 22, 1992, took part in a Pentagon conference on "Innovation" organized by the Director of Net Assessment, Office of the Secretary of Defense.
 - Spoke on "Consuming Fears: The Politics and Science of Product Risks" at The MITRE Corporation's Distinguished Lecturer Series, January 29, 1992 in Bedford, Massachusetts.
 - Attended the Third Annual Strategy Conference sponsored by the Strategic Studies Institute of the U.S. Army War College, held February 12-14, 1992 at Carlisle Barracks, Pennsylvania.
 - Participated in the Office of Net Assessment's (DOD) second meeting on military innovation, held in the Pentagon on March 11, 1992.
 - Gave a talk on "The Politics of U.S. Sealift and Airlift" at the MIT Ocean Engineering Department's Tankard Seminar, March 20, 1992.
 - On March 23, 1992, gave a presentation on "The Politics of SDI" in the History of Science Department seminar series at the University of Pennsylvania.
 - Was a member of the Defense Industrial Base panel at the Conference on U.S. Defense Strategy in Transition sponsored by the American Security Council, the Army War College, and the National Defense University, which was held in Boston, Virginia on April 1-2, 1992.
 - Conferred on April 10, 1992 with Mr. Seiji Morii, Vice Chairman of Kansai Electric Power of Japan, as part of the DACS/Energy Laboratory's nuclear waste project.
 - Participated in the Devising Seminar for the Army Environmental Policy Institute that was held at MIT on April 23-24, 1992 and that was hosted by the MIT Department of Urban Studies and Planning.
 - On April 24, 1992, delivered a talk on the reasons why the Navy was not selected to build the atomic bomb at the MIT Ocean Engineering Department's Tankard Seminar.

S Y M P O S I A • 1 9 9 1 / 1 9 9 2

"Research in Progress: The 1992 DACS Symposium"

March 13, 1992

MIT

Cambridge, Massachusetts

Presentations by the seven DACS working groups of projects undertaken during the past year

Co-sponsored by DACS:

"American-Israeli Seminar on Arms Control in the Middle East"

February 6 and 7, 1992

**American Academy of Arts and Sciences
Cambridge, Massachusetts**

Organized by Drs. Marvin Miller and Avner Cohen in response to requests by a number of Israeli leaders for a private dialogue on arms control with American experts.

"Workshop on Implications of Tactical and Strategic Defenses for U.S. Security and the ABM Treaty"

October 29, 1991

**U.S. House of Representatives
Washington, DC**

The program's courses—what MIT prefers to call subjects—are open to all students eligible to attend classes at MIT, including cross-enrollers from Harvard and Wellesley. Most of the subjects are offered at the graduate level and through the Political Science Department.

Political Science doctoral candidates may use Defense and Arms Control Studies as one of their fields of concentration. Within that context, defense and arms control studies has two principal objectives: first, it introduces the student to the study of American defense policy, including the policy process, arms control, force structure, and military budgets. Second, it introduces the student to the study of the role of force in international politics and how countries have historically pursued their security interests. Students are expected to develop competence in the methods of systems analysis, technology assessment, and strategic reasoning that shape the size and composition of U.S. strategic nuclear and general purpose forces. The international military competition, the prospects for arms control and their implications for U.S. force planning receive special consideration in several subjects. Others examine some of the same issues by contrasting U.S. experiences and approaches with those of rivals and allies.

Students who plan to offer Defense and Arms Control Studies for the general examination take two subjects from those listed below in the Forces and Force Analysis section, and one subject each from the listing in the Defense Politics and in the Comparative Defense Policy sections. Competence in technical analysis is required. A background in economics to intermediate level with particular emphasis on macroeconomics and public finance is advisable. The subjects in the Forces and Force Analysis section will provide sufficient review of the technical approaches to be examined.

The write-off requirement is three subjects with equal distribution among the three sections preferred although approval for alternative distributions may be granted in consultation with field faculty. A number of substantive fields in the Political Science Department deal with important determinants of U.S. defense programs and expenditures. Among the most closely related are: Science, Technology and Public Policy; American Politics; International Relations and Foreign Policy; and Soviet Studies. Students of defense policy are also encouraged to take subjects in economics.

FORCES AND FORCE ANALYSIS

17.476 Analysis of Strategic Nuclear Forces (Postol)

STS.516

Introduces the assessment of strategic nuclear forces. Emphasizes the development of force requirements and methods of analyzing alternative force postures in terms of missions, effectiveness, and cost. The history of U.S.-Soviet strategic competition provides the backdrop against which the evolution of nuclear strategy and forces is considered.

17.477 Technology and Policy of Strategic Nuclear Weapons (Postol)

STS.076

Examines in detail the technology of nuclear weapons systems. Topics include nuclear weapons design, effects, targeting, and delivery; ballistic and air breathing missile propulsion and guidance; communications and early warning techniques and systems; and anti-missile, air, and submarine systems. Combines the discussion of technical materials with the national security policy issues raised by the capabilities of these technologies. Considers security issues from the distinct and often conflicting perspectives of technologists, military planners, and political leaders.

17.482 U.S. General Purpose Forces (Posen)

Based on the concept of Grand Strategy as a system of interconnected political and military means and ends. Topics covered include U.S. grand strategy, the organization of the U.S. military, the defense budget, ground forces, tactical air forces, naval forces, power projection forces, and the control of escalation. Particular episodes of military history that offer insights into current conventional forces issues examined. Graduate students are expected to pursue the subject at greater depth through reading and individual research.

17.486 Nuclear Weapons and Arms Control: Technology and Policy (Rathjens and Ruina)

Reviews weapons systems developments and efforts at arms control. Focuses on the interaction of technological factors with strategic concepts, intelligence assessments, and political judgment. Topics: nuclear weapons technology and effects, nuclear weapons proliferation, strategic defensive and offensive weapons, and analysis of current strategic arms programs. To the extent possible, experts who have played key roles in the topics covered are invited to give guest lectures.

17.487 Quantitative Approaches to Defense Problems (Rathjens)

Systems analysis of policy choices in the defense/arms control area. Consideration of cost and benefit criteria. Analytical approaches and critique of applications.

**TEACHING
AT DACS**

AMERICAN DEFENSE POLITICS

17.460 Defense Politics (Sapolsky)

Examines the politics affecting U.S. defense policies. Includes consideration of intra- and inter-service rivalries, civil-military relations, contractor influences, congressional oversight, peace movements in historical and contemporary perspectives, and U.S. defense politics before, during, and after the Cold War.

17.466 Seminar in Arms Control and Defense Policy (Rathjens and Ruina)

Assessment of post-World War II arms control efforts and major issues in defense policy. Emphasis on current issues. Topics, varying from year to year, treated in some detail. Consideration of technical questions, political questions, economic and military impact. Examples: START and space-based ballistic missile defense.

17.471 American National Security Policy (Meyer)

Introduces the student to the problems and issues confronting American national security and the process by which American national security policy is formulated. The nature of the international system (post-World War II), the theoretical requirements for deterrence and defense, and alternative strategies for implementing American national security policy are discussed. The roles of the President, National Security Council, Department of Defense and armed services, the Congress, and public opinion in formulating national security policy are examined.

COMPARATIVE DEFENSE POLICY

17.462 Innovation in Military Organizations (Posen and Sapolsky)

Explores the origins, rate, and impact of innovations in military organization, doctrine, and weapons. Emphasis on organization theory approaches. Comparison with non-military and non-U.S. experience included.

17.474 Comparative Defense Management (Sapolsky)

Examines the management issues in the organization, equipping, and direction of military forces. Of particular interest are the effects of defense activities on national research and manufacturing capabilities. Comparisons made with European, Japanese, Israeli, and Russian experience.

17.484 Comparative Grand Strategy and Military Doctrine (Posen)

A comparative study of the grand strategies and military doctrines of the great powers in Europe (Britain, France, Germany, and Russia) from the late 19th to the mid-20th century. Examines strategic developments in the years preceding and during World Wars I and II. What factors have exerted the greatest influence on national strategies? How may the quality of a grand strategy be judged? What consequences seem to follow from grand strategies of different types? Open to undergraduates with permission of instructor.

**TEACHING
AT DACS**

17.490 Post-Soviet Defense Policy and Planning: The Implications of the Disintegration of a Military Superpower (Meyer)

This course examines the collapse of Soviet military power and the implications of the evolution of military power among the post-Soviet states. From a broader political science perspective the course has four objectives: (1) to dissect the causes of the collapse of Soviet military power; (2) to examine the process of adaptation and transformation among the military and defense-industrial organizations in response to dramatic changes in their policy environment; (3) to examine the political, economic, social, military, and technological forces that will shape the security concepts, options, choices, and residual capabilities in the region in the decade ahead; and (4) to analyze the international security implications of the likely trends in the development of military power among the Soviet successor states.

ADVANCED AND CROSS-FIELD OFFERINGS

**17.465 The Nuclear Age [Engineering school-wide elective]
(Rathjens, Ruina, et al.)**

Based substantially on the 13-part public television series “War and Peace in the Nuclear Age.” Includes the history and technology of nuclear weapons, including the discovery of fission; the development of fission and fusion weapons; nuclear testing and efforts to control the technology; problems in the proliferation of weapons; advanced nuclear weapons technologies; changing perceptions about the role of nuclear weapons in world affairs.

17.468 Foundations of Security Studies (Posen)

Aims to develop a working knowledge of the theories and conceptual frameworks that form the intellectual basis of security studies as an academic discipline. Particular emphasis on balance of power theory, organization theory, civil-military relations, and the relationship between war and politics. The reading list includes Jervis, Schelling, Waltz, Blainey, von Clausewitz, Brodie, Allison, Steinbruner, and Huntington. Students write a seminar paper in which theoretical insights are systematically applied to a current security issue.

**17.480 Technology, Politics, and Weapons Choice (Postol)
STS.519**

Analyzes decisions to develop or acquire new weapons systems that had, or could have had, a major influence on the arms race. Examines the interplay of political and technical factors in the decision-making process. Representative weapons systems include the hydrogen bomb, the nuclear-powered submarine, tactical nuclear weapons, the Polaris submarine-launched ballistic missile, the B-1 bomber, MIRVs, the Moscow anti-ballistic defense, the U.S. Safeguard/Sentinel missile defense, and others. Graduate students are expected to pursue the subject at greater depth through reading and individual research.

17.492 Research Seminar in Post-Soviet Security Studies (Meyer)

An advanced seminar that examines historical and contemporary issues in Soviet defense planning. Students select individual research topics and work with original source materials.

DACS - AFFILIATED DEGREE RECIPIENTS • 1991/1992

Neta C. Crawford
Ph.D. (Political Science), June 1992

Peter J. Liberman
Ph.D. (Political Science), February 1992

Katherine Magraw
Ph.D. (Political Science), June 1992

Paul N. Nagy
S.M. (Political Science), February 1992

“Force Prone States: Sources of Highly Militarized Foreign Policy”

“Does Conquest Pay?: The Exploitation of Occupied Industrial Economies”

“Weapons Brokers and Policy Entrepreneurs: Congress and the Strategic Policy Community During the Reagan Era”

“The U.S. Navy, Tactical Nuclear Weapons and the Feasibility of On-Site Inspections”



GRADUATE STUDENTS • 1991/1992

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Dean Cheng	Princeton University (Politics)	Gregg Martin	United States Military Academy (Civil Engineering)
James Chung	Stanford University (Political Science, International Policy Studies)	Brian Nichiporuk	University of Chicago (Political Science)
Owen Cote	Harvard University (Social Studies)	Kevin Oliveau	Massachusetts Institute of Technology (Computer Science)
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Randall Forsberg	Barnard College (English)	Jeffrey Sands	Amherst College (American Studies)
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Eric Heginbotham	Swarthmore College (Political Science)	Robert Snyder	United States Military Academy (Social Science)
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Jane Kellett	Oberlin College (English)	Judyth Twigg	Carnegie Mellon University (Physics) University of Pittsburgh (Political Science)
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Ethan McKinney	University of California-Berkeley (Political Science)	Hong Xue	Peking University (International Politics) Nanjing University-The Johns Hopkins School (International Relations/US Defense Policy)
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MASTERS CANDIDATES

Paul Nagy	Boston University (International Relations)
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THE MIT CENTER FOR INTERNATIONAL STUDIES

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